IN THE CLAIMS

1. (Currently Amended) A duobinary optical transmission apparatus comprising:

a light source arranged to output an optical carrier;

an NRZ optical signal generator arranged to receive an NRZ electrical signal, to modulate the optical carrier into an NRZ optical signal according to the NRZ electrical signal, and to output the NRZ optical signal to a node O ; and

a duobinary optical signal generator, including a light phase modulator, said duobinary optical signal generator arranged to receive a~~the~~ precoded NRZ electrical signal and to modulate the NRZ optical signal and outputs the modulated signal into a duobinary optical signal,- wherein the NRZ optical signal generator and the duobinary signal generator are configured so that each bit of the NRZ optical signal at node O, the light phase modulator shifts the phase of the optical signals from 0 to π or from π to 0 so that bits of '1' located at both sides of each bit of '0' have different phases from each other.

2. (Original) The duobinary optical transmission apparatus as claimed in claim 1, wherein the NRZ optical signal generator includes:

a plurality of first modulator driving amplifiers that amplify and output the NRZ electrical signal; and

a light intensity modulator that modulates an intensity of the optical carrier according to driving signals input from the first modulator driving amplifiers.

3. (Currently Amended) The duobinary optical transmission apparatus as claimed in claim 1, wherein the duobinary optical signal generator includes:

a precoder arranged to encode the NRZ electrical signal;

a plurality of second modulator driving amplifiers that amplify and output the encoded signal; and

wherein the ~~a~~ light phase modulator ~~that~~ modulates a phase of the NRZ optical signal according to driving signals input from the second modulator driving amplifiers.

4. (Original) The duobinary optical transmission apparatus as claimed in claim 2, wherein the light intensity modulator is a Mach-Zehnder interference type modulator.

5. (Original)A duobinary optical transmission apparatus as claimed in claim 4, wherein the Mach-Zehnder interference type modulator is a dual armed Z-cut Mach-Zehnder interference type light intensity modulator.

6. (Original) The duobinary optical transmission apparatus as claimed in claim 4, wherein the Mach-Zehnder interference type modulator is a single armed X-cut type Mach-Zehnder interference type light intensity modulators

7. (Currently Amended) The duobinary optical transmission apparatus as claimed in claim 1~~3~~, wherein the light phase modulator is a Mach-Zehnder interference type modulator.

8. (Original)) The duobinary optical transmission apparatus as claimed in claim 7, wherein the Mach-Zehnder interference type modulator is a dual armed Z-cut Mach-Zehnder interference type light intensity modulator.

9. (Original) The duobinary optical transmission apparatus as claimed in claim 7, wherein the Mach-Zehnder interference type modulator is a single armed X-cut type Mach-Zehnder interference type light intensity modulators

10. (Currently Amended) The duobinary optical transmission apparatus as claimed in claim 2, wherein the duobinary optical signal generator includes:

a precoder arranged to encode the NRZ electrical signal;

a plurality of second modulator driving amplifiers that amplify and output the encoded signal; and

wherein the light phase modulator ~~that~~ modulates a phase of the NRZ optical signal according to driving signals input from the second modulator driving amplifiers.

11. (Original) The duobinary optical transmission apparatus as claimed in claim 1, wherein the NRZ electrical signal is generated by a pulse pattern generator

12. (Currently Amended) A method for outputting a duobinary optical signal, comprising the steps of:

outputting an optical carrier signal;

receiving an NRZ electrical signal;

modulating the optical carrier into an NRZ optical signal according to the NRZ electrical signal, and to output the NRZ optical signal to a node O; and

modulating, via a light phase modulator, the NRZ optical signal into a duobinary optical signal, wherein the NRZ optical signal generator and the duobinary signal generator are configured so that each bit of the NRZ optical signal at node O, the light phase modulator shifts the phase of the optical signals from 0 to π or from π to 0 so that bits of '1' located at both sides of each bit of '0' have different phases from each other.

13. (Original) The method as claimed in claim 12, further comprising the step of outputting the duobinary optical signal to an optical fiber.

14. (Original) The method as claimed in claim 12, further comprising the step of changing a dispersion factor of the optical fiber by adjusting an extinction ratio and a chirp variable of the modulator.